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Hart

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(54) **MODULAR ELECTRONIC DEVICE CASE FOR USE WITH TABLET-SHAPED ELECTRONIC DEVICES**

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(51) **Int. Cl.**

B65D 5/52	(2006.01)
H04B 1/3877	(2015.01)
H04B 1/3888	(2015.01)

(52) **U.S. Cl.**
CPC ***H04B 1/3877*** (2013.01); ***H04B 1/3888*** (2013.01)

(58) **Field of Classification Search**
CPC combination set(s) only.
See application file for complete search history.

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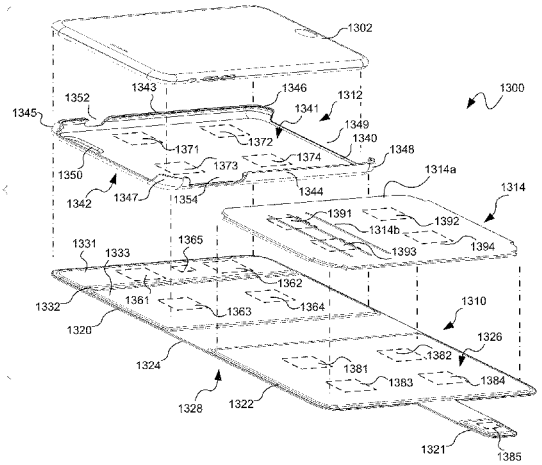
(57) **ABSTRACT**

A modular electronic device case includes a jacket and a shell removably coupled to the jacket. A tablet-shaped electronic device, such as a tablet computer, may be secured in the shell and may be covered by the jacket when the shell is coupled to the jacket. The shell may be removably coupled to the jacket using magnetic coupling. Thus, the tablet-shaped electronic device, when secured in the shell, may be used with or without the jacket. The jacket may also include one or more foldable lines separating the jacket into foldable panels capable of being folded to form a stand for supporting the device in different configurations. The modular case may also include one or more additional components coupled to the jacket including, without limitation, a pocket, a backup battery, and/or a keyboard.

19 Claims, 11 Drawing Sheets



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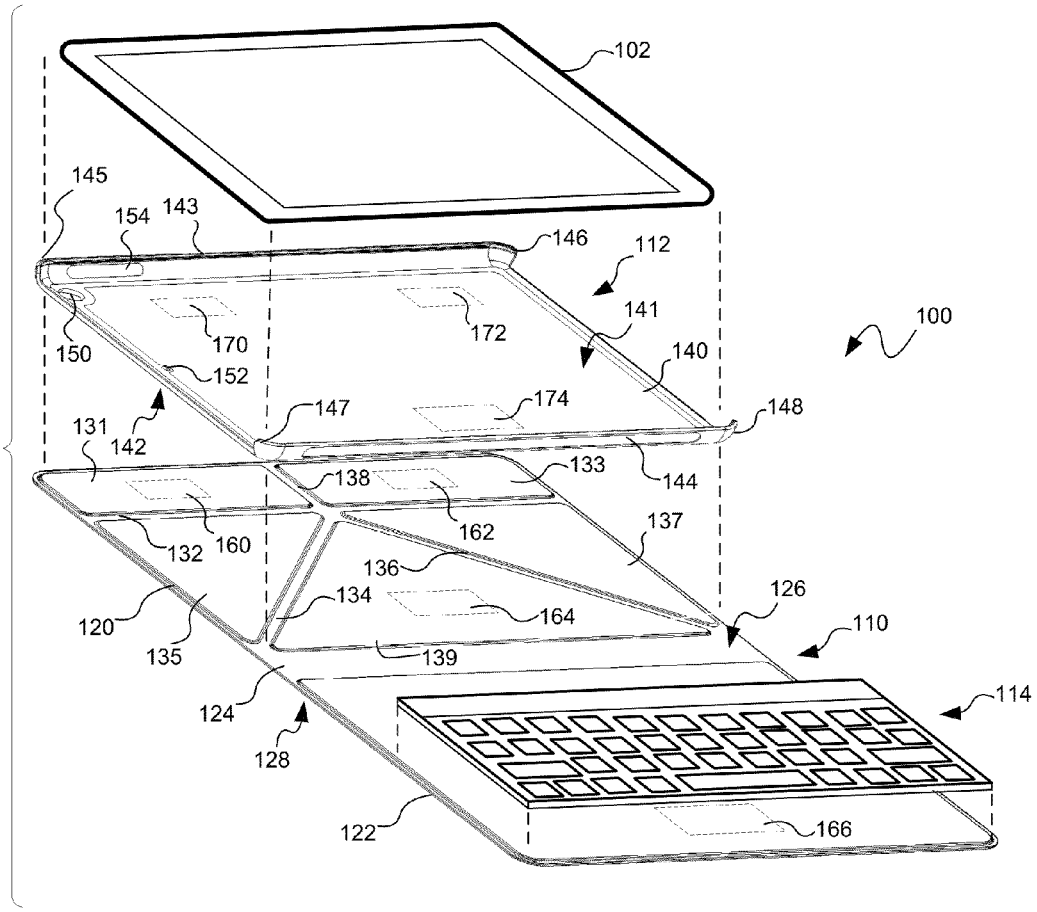
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FIG. 1

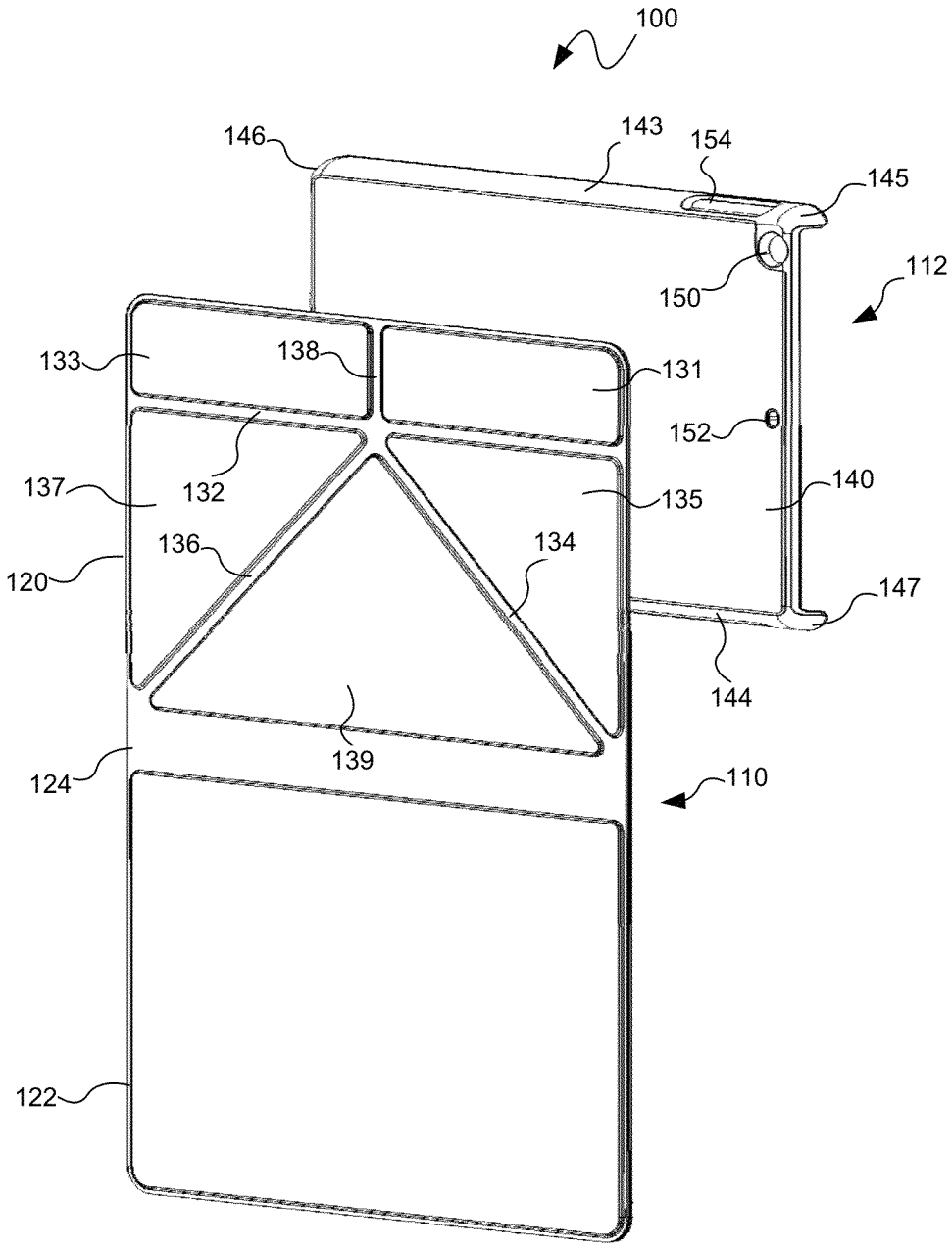
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FIG. 2

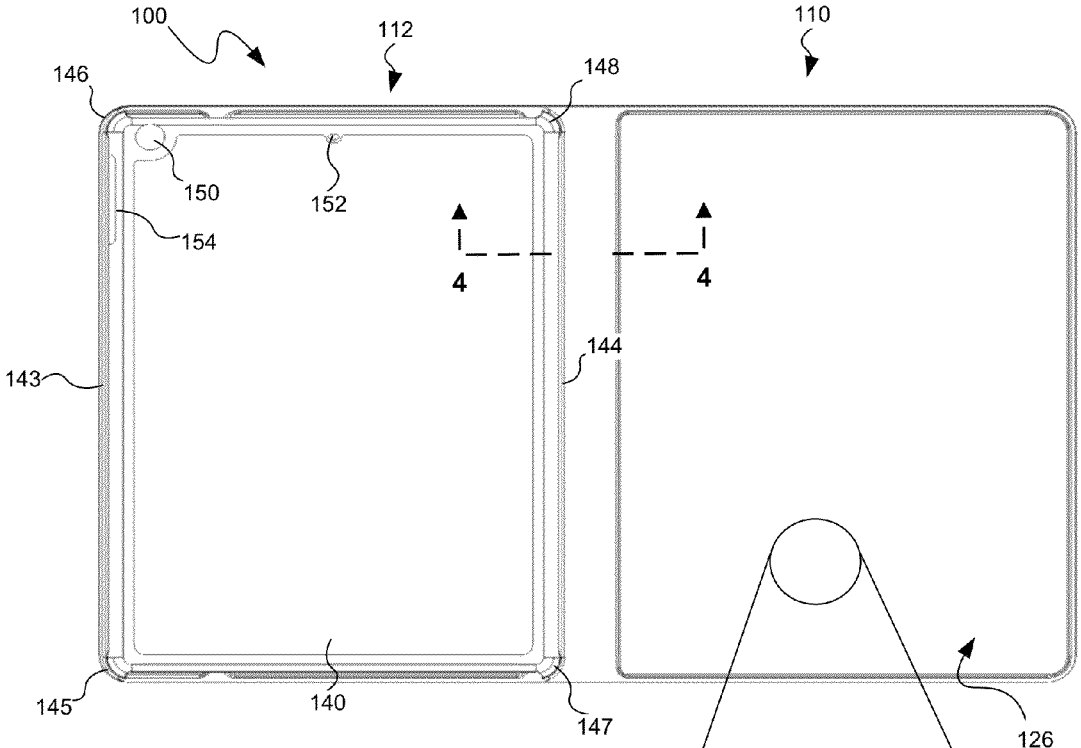

FIG. 3

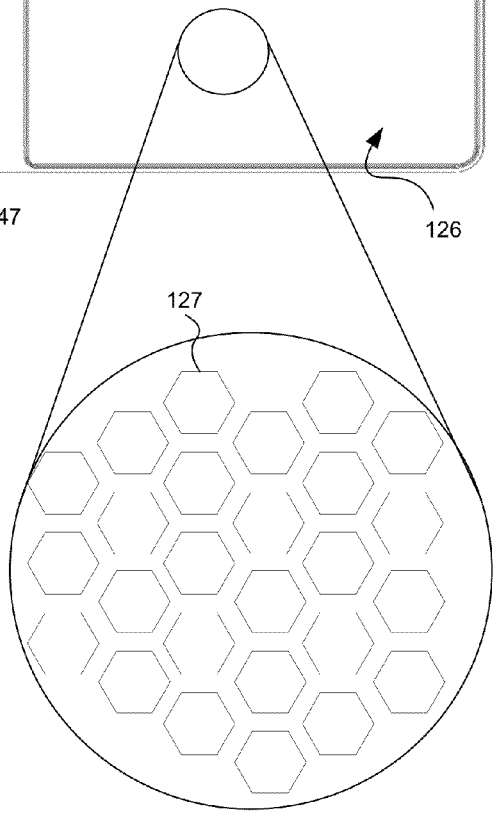

FIG. 3A

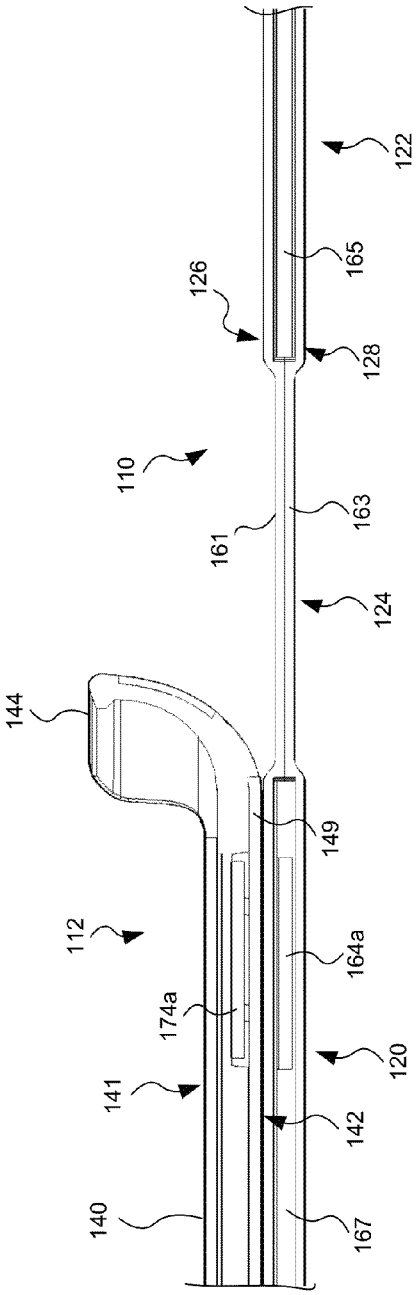

FIG. 4

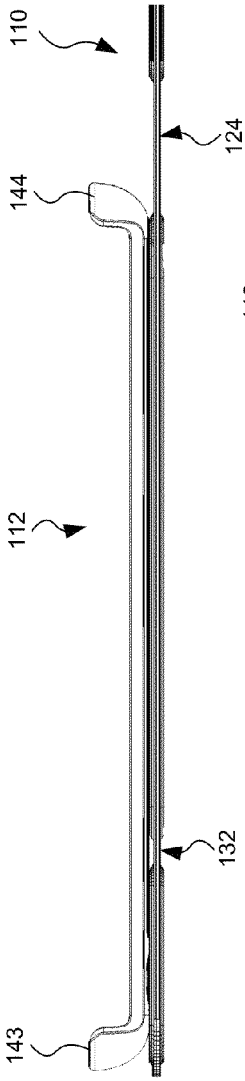

FIG. 5

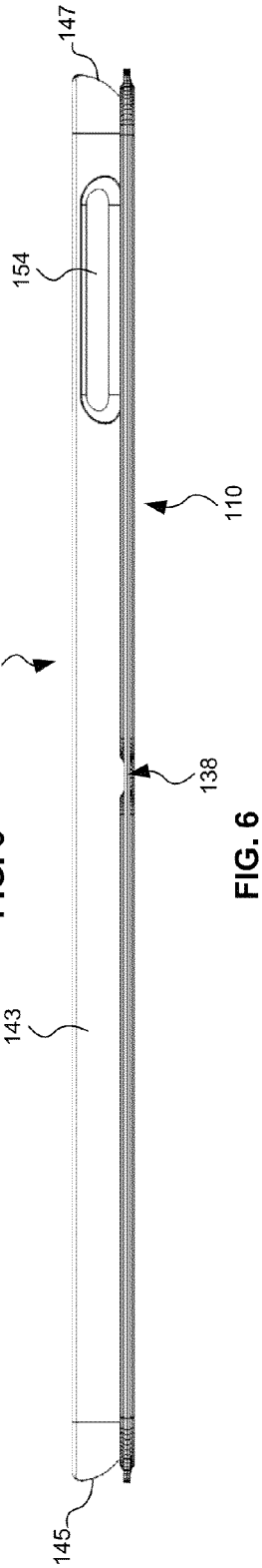

FIG. 6

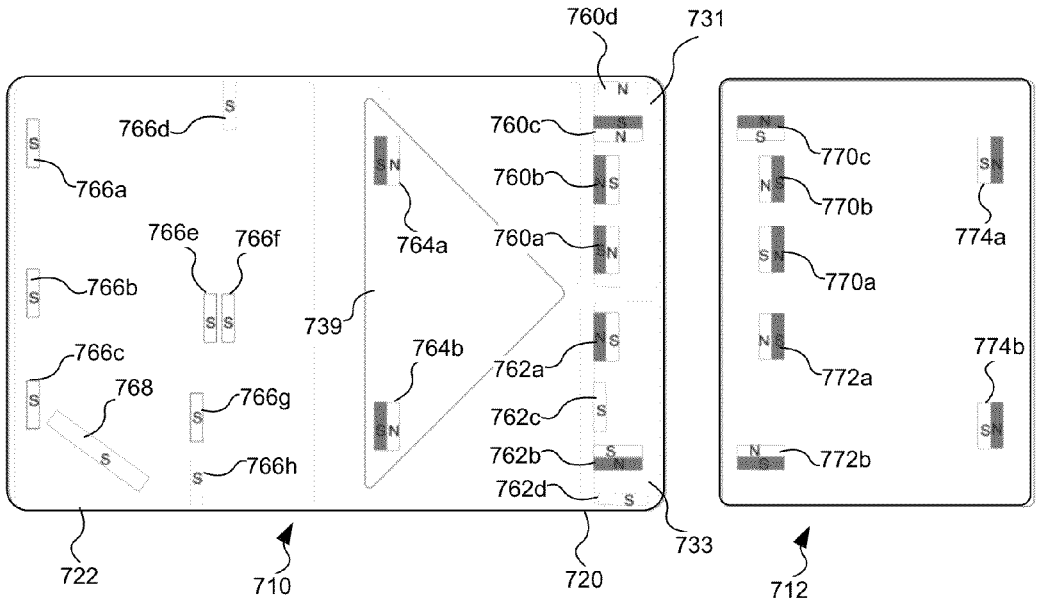
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FIG. 7

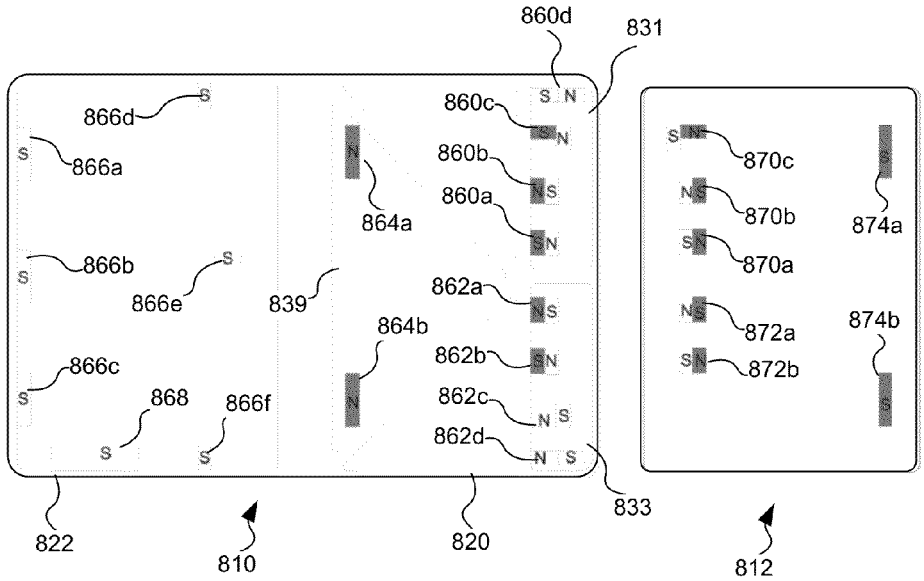
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FIG. 8

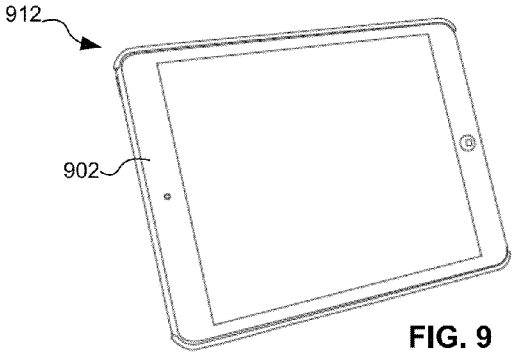

FIG. 9

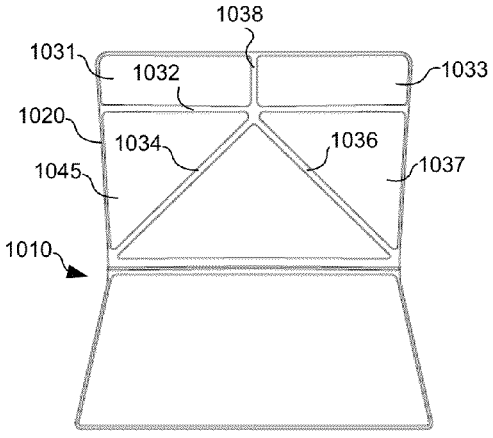

FIG. 10A

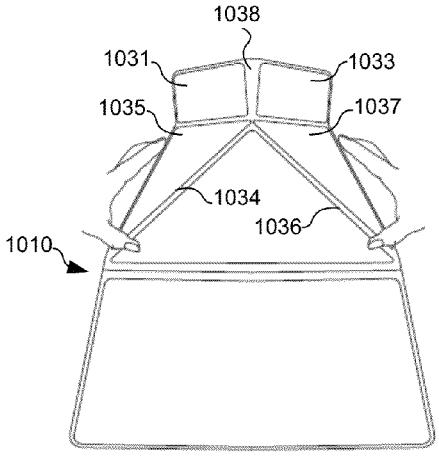

FIG. 10B

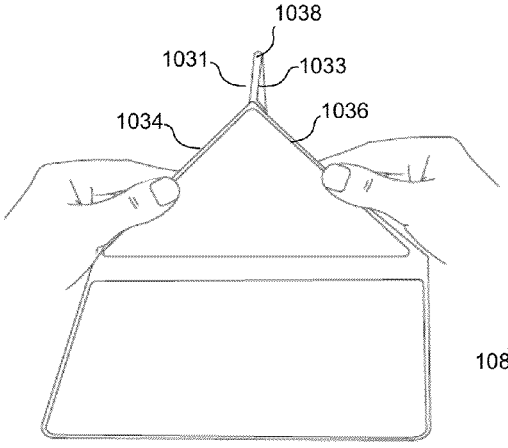

FIG. 10C

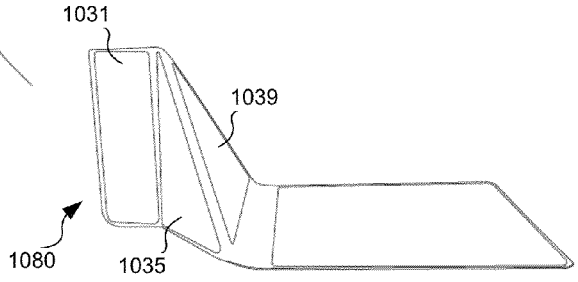

FIG. 10D

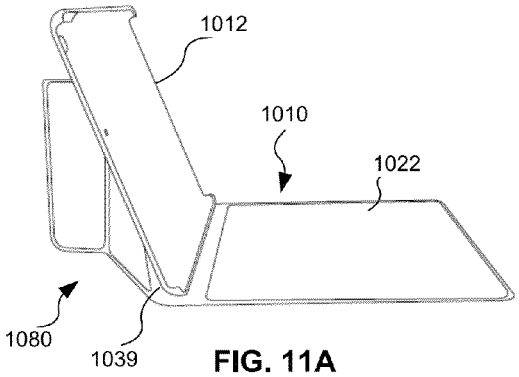

FIG. 11A

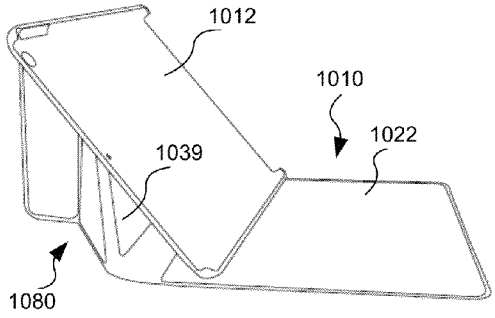

FIG. 11B

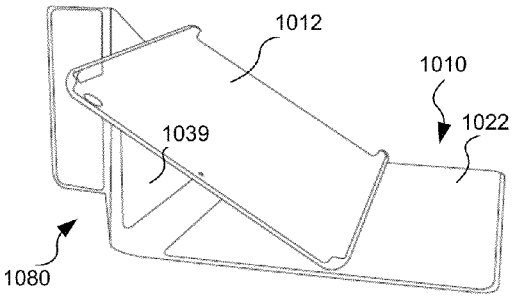

FIG. 11C

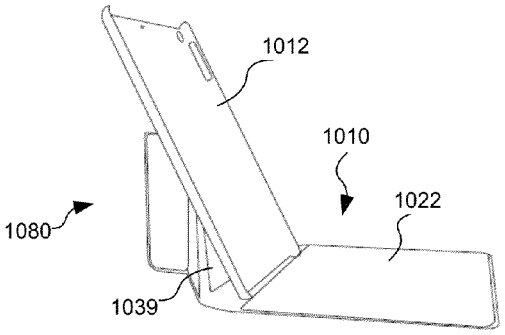

FIG. 11D

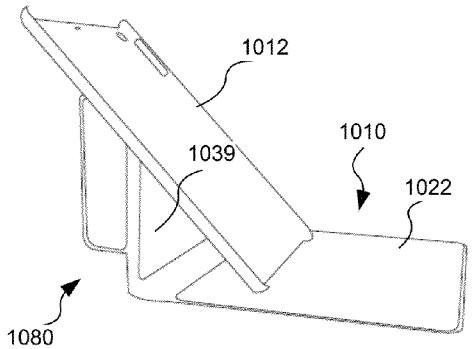

FIG. 11E

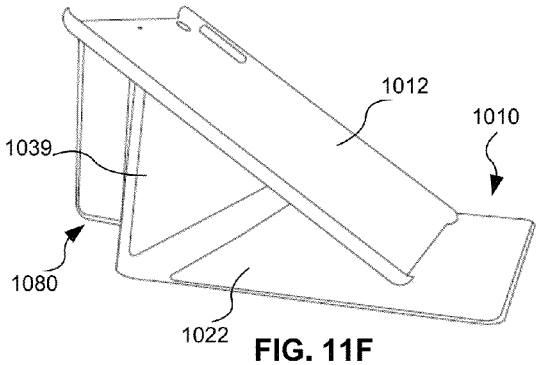

FIG. 11F

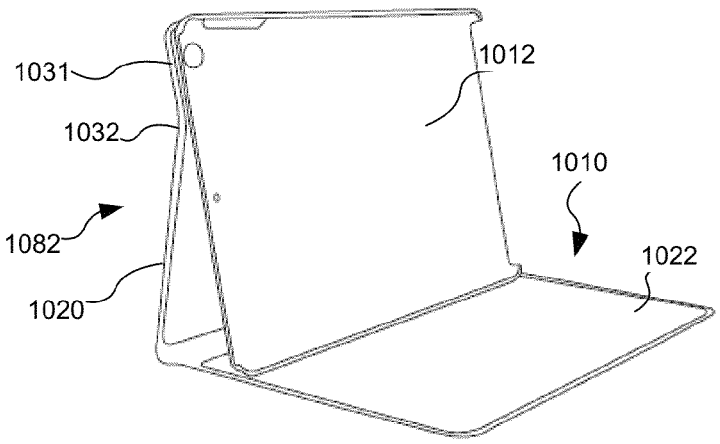

FIG. 12A

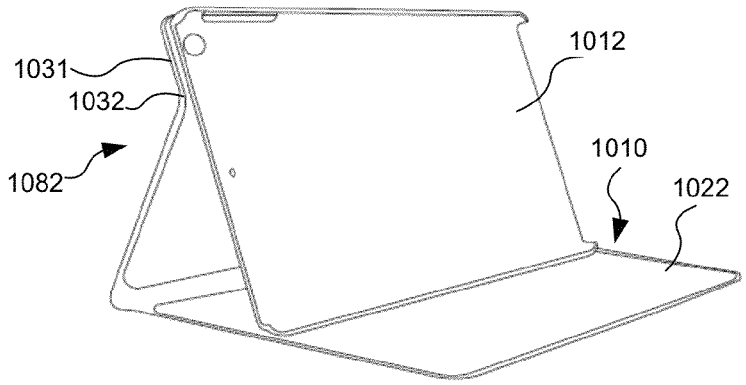

FIG. 12B

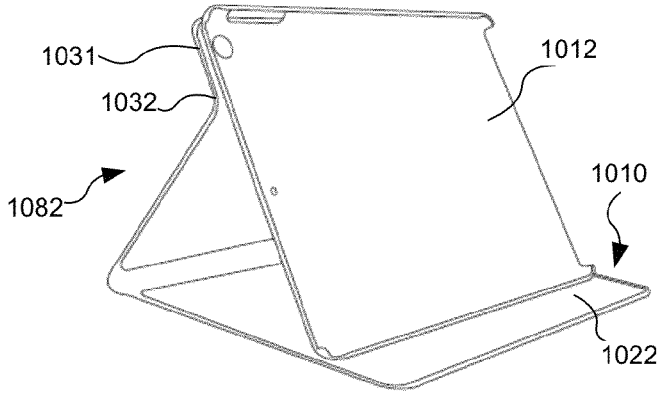

FIG. 12C

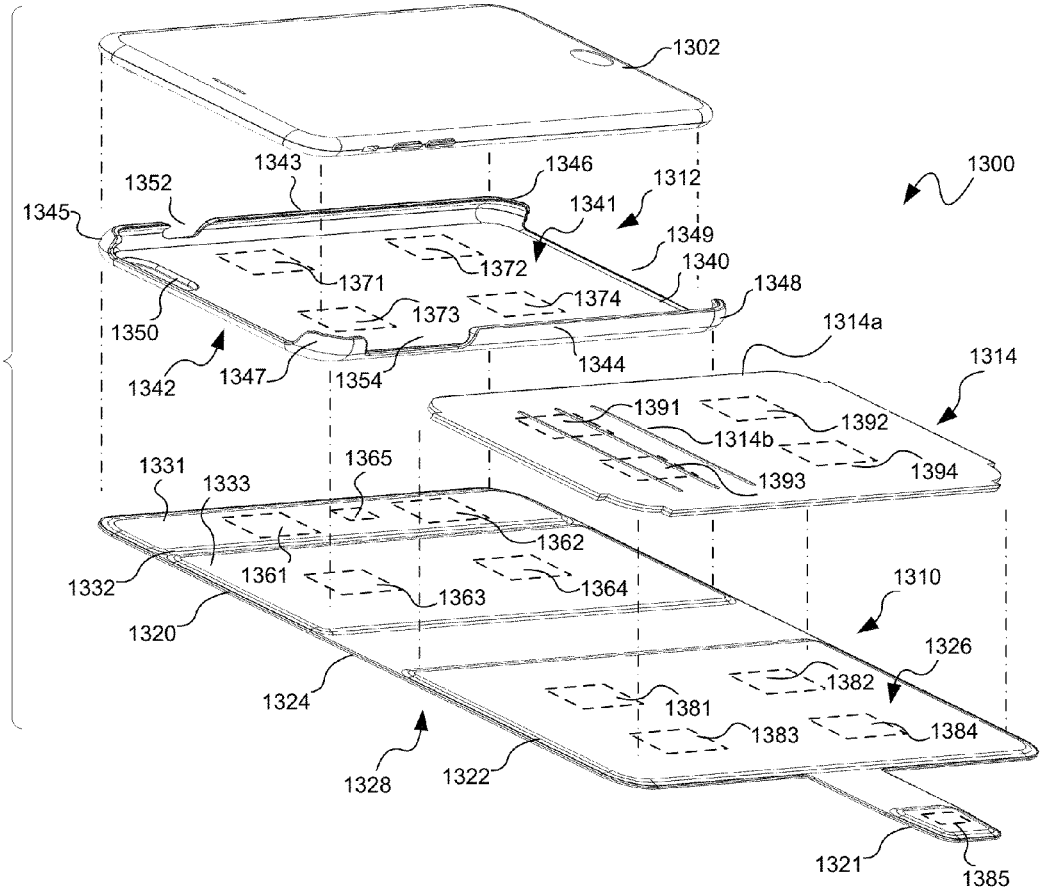
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FIG. 13A

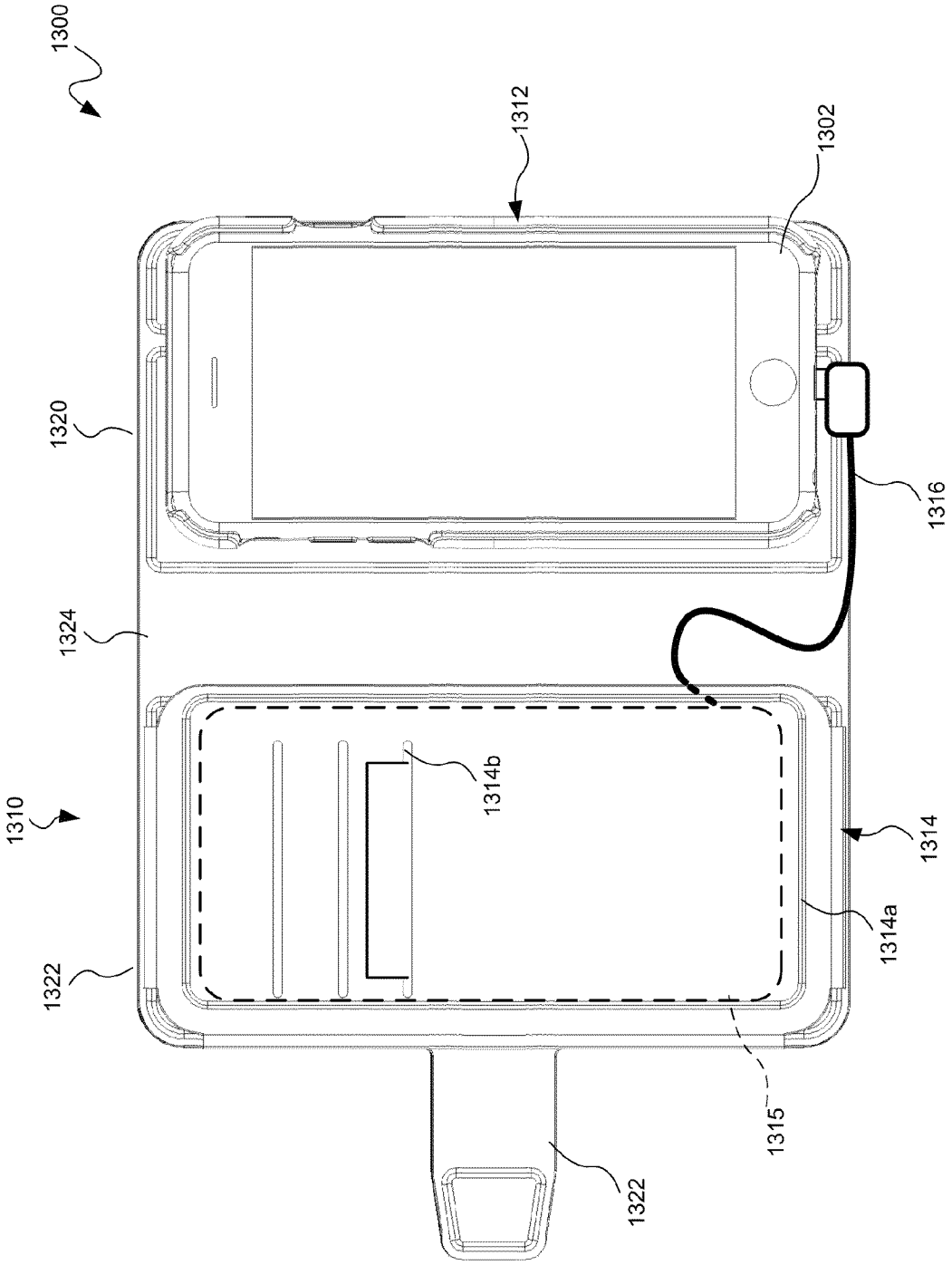
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FIG. 13B

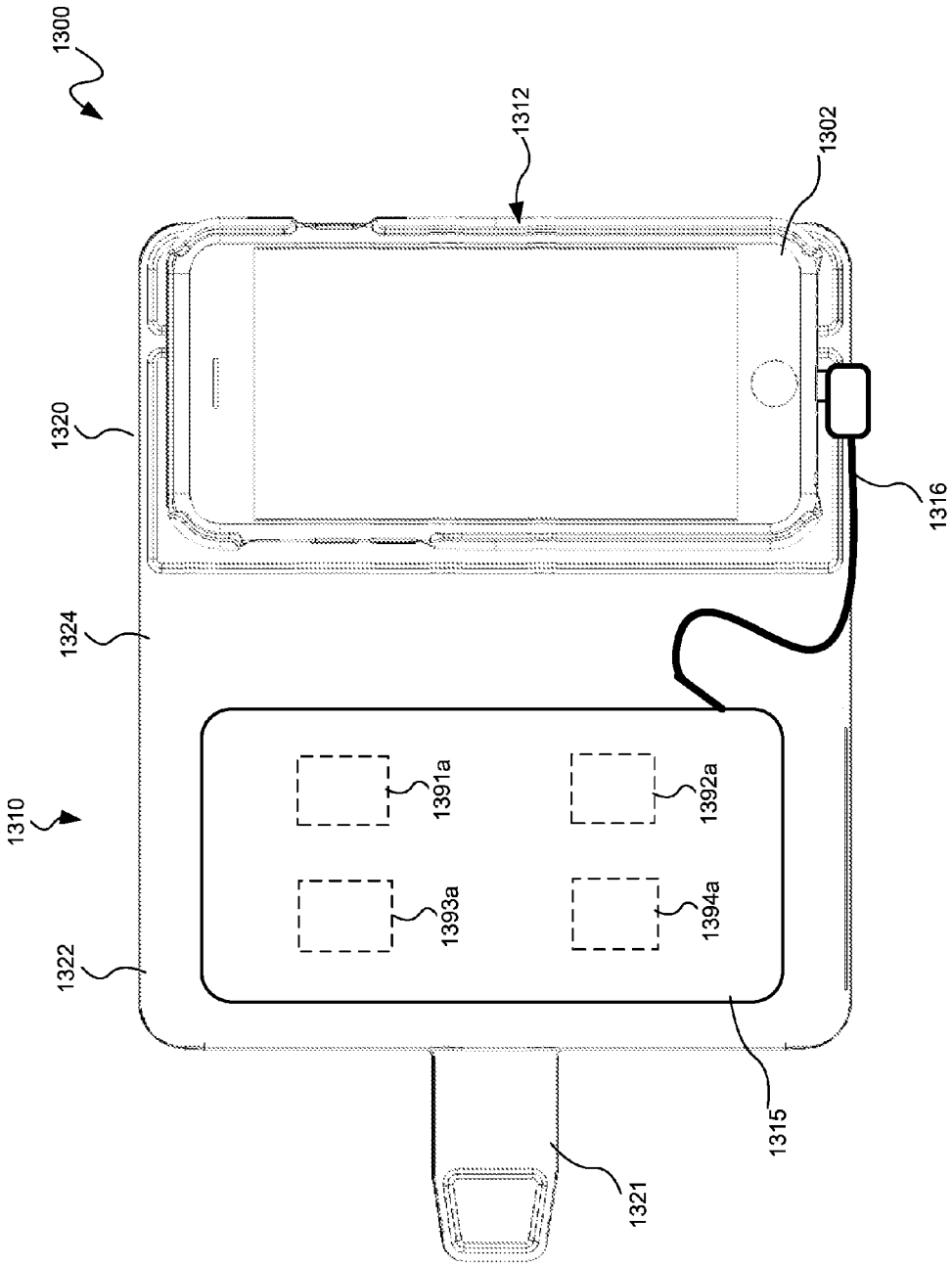
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FIG. 13C

MODULAR ELECTRONIC DEVICE CASE FOR USE WITH TABLET-SHAPED ELECTRONIC DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of co-pending U.S. patent application Ser. No. 14/456,672 filed on Aug. 11, 2014, fully incorporated herein by reference.

TECHNICAL FIELD

The present invention relates to covers or cases for electronic devices such as tablet computers and more particularly, to a modular electronic device case including jacket, tablet shell, and keyboard.

BACKGROUND INFORMATION

Various types of covers and cases have been designed for electronic devices including tablet computers such as an iPad® tablet computer. Many of these cases attempt to protect the electronic device or tablet computer from damage without adding too much bulk and/or weight and without sacrificing the functionality of the device. Some cases add additional functional features, such as a wireless keyboard, which further adds to the bulk and/or weight. One of the challenges is designing a case that provides the desired protection for the device without sacrificing functionality and the lightweight, portable design of the device and while also allowing a wireless keyboard or other additional component.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features and advantages will be better understood by reading the following detailed description, taken together with the drawings wherein:

FIG. **1** is an exploded perspective view of a modular tablet case, consistent with an embodiment of the present disclosure.

FIG. **2** is a perspective back view of the modular tablet case shown in FIG. **1** without the keyboard and the tablet computer.

FIG. **3** is a top plan view of the modular tablet case shown in FIG. **1** without the keyboard and the tablet computer.

FIG. **3**A is an enlarged view of the surface texture inside the jacket shown in FIG. **3**, consistent with an embodiment of the present disclosure.

FIG. **4** is a side cross-sectional view of the modular tablet case taken along line **4**-**4** in FIG. **3**.

FIG. **5** is a side view of the modular tablet case shown in FIG. **3**.

FIG. **6** is a back end view of the modular tablet case shown in FIG. **3**.

FIG. **7** is a top schematic view of a jacket and shell of a modular tablet case indicating locations and polarities of magnets for magnetic coupling, consistent with an embodiment of the present disclosure.

FIG. **8** is a top schematic view of a jacket and shell of a modular tablet case indicating locations and polarities of magnets for magnetic coupling, consistent with another embodiment of the present disclosure.

FIG. **9** is a perspective view of a shell receiving a tablet computer, consistent with an embodiment of the present disclosure.

FIGS. **10**A-**10**D illustrate a jacket being folded into a stand configuration, consistent with an embodiment of the present disclosure.

FIGS. **11**A-**11**F illustrate various positions of a shell supported on the stand configuration formed by the folded jacket, consistent with an embodiment of the present disclosure.

FIGS. **12**A-**12**C illustrate various positions of a shell supported on another embodiment of a stand configuration formed by a folded jacket.

FIG. **13**A is an exploded perspective view of yet another embodiment of a modular electronic device case, consistent with the present disclosure.

FIG. **13**B is a plan view of the modular electronic device case show in FIG. **13**A, assembled and opened with a backup battery connected to the electronic device.

FIG. **13**C is a plan view of another embodiment of the modular electronic device case show in FIG. **13**A, assembled and opened with a backup battery coupled to the second jacket portion and connected to the electronic device.

DETAILED DESCRIPTION

A modular electronic device case, consistent with embodiments of the present disclosure, includes a jacket and a shell removably coupled to the jacket. A tablet-shaped electronic device, such as a tablet computer, may be secured in the shell and may be covered by the jacket when the shell is coupled to the jacket. The shell may be removably coupled to the jacket using magnetic coupling. Thus, the tablet-shaped electronic device, when secured in the shell, may be used with or without the jacket. The jacket may also include one or more foldable lines separating the jacket into foldable panels capable of being folded to form a stand for supporting the device in different configurations. The modular case may also include one or more additional components coupled to the jacket including, without limitation, a pocket, a backup battery, and/or a keyboard.

As used herein, "tablet computer" refers to any type of mobile computer including a display, circuitry and battery in a tablet shape. A tablet computer is not limited to any particular size or functionality and may include tablet-shaped smart phones. Embodiments of the modular electronic device cases described herein may be used with larger tablet computers, such as an iPad® tablet computer, or smaller tablet computers, such as an iPad® mini tablet computer or an iPhone® tablet-shaped smart phone. Embodiments of the modular electronic device cases may also be used with other tablet-shaped electronic devices.

Referring to FIGS. **1** and **2**, a modular tablet case **100**, consistent with embodiments of the present disclosure, is shown and described. The modular tablet case **100** may be used with a tablet computer **102**, such as an iPad® tablet computer, or other tablet-shaped electronic device. The modular tablet case **100** generally includes a jacket **110**, a shell **112** removably coupled to one portion of the jacket **110**, and a keyboard **114** removably coupled to another portion of the jacket **110**. In an example embodiment, the shell **112** and the keyboard **114** are removably coupled to the jacket **110** using magnetic coupling. The jacket **110** and/or shell **112** may have various sizes to accommodate different sized tablet computers. In one embodiment, different sized shells **112** designed for different sized tablet computers **102**, such as an iPad® Air tablet computer and an iPad® 4th Generation tablet computer, may be used with the same sized jacket **110**. Thus, one jacket **110** may be used with different shells and tablet computers, thereby extending the utility of the modular tablet case **100** as the sizes of tablet computers change.

The jacket **110** includes a first jacket portion **120** hingedly coupled to a second jacket portion **122** with a hinge **124**. The hinge **124** may be a living hinge formed by the material forming the first and second jacket portions **120**, **122**. The jacket **110** has an inside surface **126** and an outside surface **128**. The shell **112** and the keyboard **114** may be removably coupled to first jacket portion **120** and the second jacket portion **122**, respectively, on the inside surface **126**. The first and second jacket portions **120**, **122** may thus be closed by folding along the hinge **124** to cover the tablet computer **102** and/or keyboard **114** when attached to the jacket **110**.

The first jacket portion **120** may include one or more foldable lines **132**, **134**, **136**, **138** separating the first jacket portion **120** into multiple foldable panels **131**, **133**, **135**, **137**, **139**. As used herein, "foldable line" refers to a linear region of the jacket **110** that is more susceptible to folding than other regions of the jacket **110**. The foldable lines **132**, **134**, **136**, **138** may be formed as living hinges from the material of the first jacket portion **120**. The first jacket portion **120** may be folded along one or more of the foldable lines **132**, **134**, **136**, **138** such that the foldable panels **131**, **133**, **135**, **137**, **139** form various stand configurations for supporting the tablet computer (with or without the shell **112**), as described in greater detail below.

In the example embodiment, the first jacket portion **120** includes at least one lengthwise foldable line **132** extending lengthwise across the first jacket portion **120**, diagonal foldable lines **134**, **136** extending from proximate the hinge **124** to a mid region of the lengthwise foldable line **132**, and a lateral foldable line **138** extending from the mid region of the lengthwise foldable line **132** to an edge of the first jacket portion **120**. The lengthwise foldable line **132** and the lateral foldable line **138** form foldable end panels **131**, **133**, and the diagonal foldable lines form foldable triangular panels **135**, **137** and a central triangular panel **139**. In this example, the first jacket portion **120** may be folded along all of the foldable lines **132**, **134**, **136**, **138** to form a stand configuration or along only the lengthwise foldable line **132** to form a stand configuration, as described in greater detail below.

In other embodiments, the first jacket portion **120** may include other configurations of foldable lines and panels capable of forming stand configurations. The first jacket portion **120** may include, for example, only the lengthwise foldable line **132**. The foldable panels may also have other shapes.

The shell **112** is designed to receive and secure the tablet computer **102**. The shell **112** includes a main body portion **140** with a front side **141** for receiving the tablet computer **102** and a back side **142** for removably coupling to the first jacket portion **120**. The shell **112** also includes at least two edge portions **143**, **144** that grip opposing edges of the tablet computer **102** to hold the tablet computer **102** with a friction fit against the front side **141**. In the example embodiment, the edge portions **143**, **144** extend lengthwise and include corner portions **145**, **146**, **147**, **148** that engage four corners of the tablet computer **102**. Other configurations of the shell **112** capable of securing a tablet computer are also within the scope of the present disclosure. The shell **112** may include, for example, only two corner portions or may include edge portions on the other edges.

The shell **112** may be designed to provide access to inputs and outputs of the tablet computer **102** when secured in the shell **112**. The example embodiment of the shell **112** includes a camera window **150** located in the main body portion **140** and aligned with the camera on the tablet computer **102**, a mic window **152** located in the main body portion **140** and aligned with the microphone on the tablet computer **102**, and a control window **154** located in the edge portion **143** and aligned with controls (e.g., volume) on the tablet computer. The shell **112** may also include other input/output access windows in other locations depending upon the tablet computer. The control access windows may be any type of openings or cut outs capable of providing access to an input or output of the tablet computer to allow the input or output to function.

The keyboard **114** may include a wireless communication system, such as a Bluetooth® wireless communication system, for wirelessly communicating with the tablet computer **102**. Although the example embodiment uses a standard QWERTY keyboard, other types of keyboards may also be used. The keyboard **114** may be used while secured to the second jacket portion **122** or while removed from the second jacket portion **122**.

In the example embodiment, the shell **112** and the keyboard **114** are removably coupled to the jacket **110** using magnetic coupling. Magnetic coupling may also be used to couple the foldable end panels **131**, **133** when folded in at least one of the stand configurations. To provide magnetic coupling, the jacket **110** includes one or more magnetic coupling regions **160**, **162**, **164**, **166**, the shell **112** includes one or more corresponding magnetic coupling regions **170**, **172**, **174**, and the keyboard **114** includes one or more corresponding magnetic coupling regions (not shown). A magnetic coupling region may include one or more magnets oriented with a polarity for magnetically attracting and coupling a magnet with an opposite polarity in a corresponding magnetic coupling region. In other embodiments, other coupling mechanisms may be used including, without limitation, hook and loop fasteners.

In the jacket **110**, for example, one or more of the first jacket portion magnetic coupling regions **160**, **162**, **164** in the panels **131**, **133**, **139** may be magnetically coupled to one or more of the corresponding shell magnetic coupling regions **170**, **172**, **174** in the shell **112** such that the back side **142** of the shell **112** is held against the inside surface **126** of the first jacket portion **120**. In one stand configuration when the first jacket portion **120** is folded along the lengthwise foldable line **132**, for example, the first jacket portion magnetic coupling regions **160**, **162** in the end panels **131**, **133** may be magnetically coupled to the corresponding shell magnetic coupling regions **170**, **172** in the shell **112**. In another stand configuration when the first jacket portion **120** is folded along all of the foldable lines **132**, **134**, **136**, **138**, the first jacket portion magnetic coupling region **164** in the central triangular panel **139** may be magnetically coupled to the corresponding shell magnetic coupling region **174** in the shell **112**. The first jacket portion magnetic coupling regions **160**, **162** in the end panels **131**, **133** may also be magnetically coupled to each other when the first jacket portion **120** is folded into at least one of the stand configurations, as described in greater detail below. The second jacket portion magnetic coupling region **166** in the second jacket portion **122** may be magnetically coupled to a keyboard magnetic coupling region (not shown) in the keyboard **114**.

Referring to FIGS. **3-6**, the structures of the example embodiment of the jacket **110** and the shell **112** are described in greater detail. Both the jacket **110** and the shell **112** may be designed with a relatively low profile such that the modular jacket case **100** is not too bulky when the jacket **110** is folded around the shell **112** and the keyboard **114**. In one example, the jacket **110** may have a thickness of less than 5 mm (e.g., about 4 mm), the shell **112** may have a thickness that is less than 15 mm (e.g., about 11 mm), and the keyboard **112** may have a thickness that is less than 10 mm.

The jacket **110** may be made from outer layers **161**, **163** of a flexible material, such as polyurethane, (see FIG. **4**) to provide the desired flexibility for folding the jacket **110**. This

flexible material allows the jacket **110** to bend or fold, for example, along the hinge **124** and foldable lines **132**, **134**, **136**, **138**. The outer layer **161** on the inside **126** of the jacket **110** (i.e. on the side receiving the shell **112** and keyboard **114**) may have a non-slip surface, for example, with texturing, to prevent the shell **112** from slipping when being supported on the first jacket portion **120** formed in a stand configuration. The non-slip surface may include, for example, a pattern or array of raised surface elements **127** (see FIG. **3**A). The outer layer **163** on the outside **128** of the jacket **110** may include a textile-grained polyurethane fabric.

The jacket **110** may also include additional rigid layers between the outer layers to provide rigidity at certain locations, for example, in the panels **131**, **133**, **135**, **137**, **139** of the first jacket portion **120** and in the second jacket portion **122**. These additional rigid layers may include one or more sheets **165**, **167** of a material that is more rigid than the material of the outer layers **161**, **163** including, without limitation, polycarbonate, fiberglass and cardboard. The sheets **165**, **167** of rigid material are not located in the hinge **124** (see FIG. **4**) or along the foldable lines **132**, **134**, **136**, **138** such that the flexible outer layers **161**, **163** form living hinges in these regions. One or more magnets **164***a* may also be sandwiched between the outer layers **161**, **163** to provide the magnetic coupling regions. The magnets may include neodymium magnets having a magnetic flux density of about 1800 gauss or other magnets of similar strength.

The shell **112** may be made of a polycarbonate material to provide the desired rigidity for securing and protecting the tablet computer. The shell **112** may also include a non-slip surface on at least the back side **142** of the shell **112** to facilitate gripping the shell **112** and to prevent the shell **112** from slipping when being supported on the first jacket portion **120** formed in a stand configuration. The non-slip surface may be provided by a layer **149** of polyurethane and may be textured with a pattern or array of raised surface elements, similar to the polyurethane of the outer layer **161** of the jacket **110**. The non-slip polyurethane may have a 30 to 40 shore A durometer.

Referring to FIGS. **7** and **8**, the magnetic coupling regions may be formed by various arrangements of magnets in a jacket **710**, **810** and a shell **712**, **812**. FIG. **7** shows an arrangement of magnets in a jacket **710** and a shell **712** designed for a larger tablet computer such as an iPad® Air tablet computer. FIG. **8** shows an arrangement of magnets in a jacket **810** and shell **812** designed for a smaller tablet computer such as an iPad® Mini tablet computer. In both of these embodiments, the arrangements of magnets may include magnets oriented such that opposite polarities (i.e., north and south magnetic poles) of corresponding coupling magnets are aligned with each other. The magnets may also be oriented to provide stronger magnetic coupling when the corresponding magnets are in a certain position, thereby biasing the shell **712**, **812** and/or keyboard to a desired position and orientation relative to the jacket **710**, **810**.

In the embodiment shown in FIG. **7**, the jacket **710** includes a group of magnets **760***a-d* in a first end panel **731**, a group of magnets **762***a-d* in a second end panel **733**, and a group of magnets **764***a-b* in a central triangular panel **739**. The shell **712** includes magnets **770***a-c* corresponding to the magnets **760***a-c* in the first end panel **731**, magnets **772***a-b* corresponding to the magnets **762***a-b* in the second end panel **733**, and magnets **774***a-b* corresponding to the magnets **764***a-b* in the central triangular panel **739**. These magnets are oriented such that north and south polarities of corresponding magnets are aligned when the shell **712** is in the desired position relative to the first jacket portion **720**. Thus, the position, orientation and polarities of the magnets facilitate orientation and alignment when magnetically coupling the shell **712** to the first jacket portion **720**. The group of magnets **766***a-h* in the second jacket portion **722** are positioned to be aligned with magnets having opposite polarities in a keyboard (not shown). The group of magnets **760***a-d* in the first end panel **731** and the group of magnets **762***a-d* in the second end panel **733** also correspond with each other to magnetically couple the end panels **731**, **733** when folded against each other.

In the embodiment shown in FIG. **8**, the jacket **810** includes a group of magnets **860***a-d* in a first end panel **831**, a group of magnets **862***a-d* in a second end panel **833**, and a group of magnets **864***a-b* in a central triangular panel **839**. The shell **812** includes magnets **870***a-c* corresponding to the magnets **860***a-c* in the first end panel **831**, magnets **872***a-b* corresponding to the magnets **862***a-b* in the second end panel **833**, and magnets **874***a-b* corresponding to the magnets **864***a-b* in the central triangular panel **839**. These magnets are oriented such that north and south polarities of corresponding magnets are aligned when the shell **812** is in the desired position relative to the first jacket portion **820**. Thus, the position, orientation and polarities of the magnets facilitate orientation and alignment when magnetically coupling the shell **812** to the first jacket portion **820**. The group of magnets **866***a-f* in the second jacket portion **822** are positioned to be aligned with magnets having opposite polarities in a keyboard (not shown). The group of magnets **860***a-d* in the first end panel **831** and the group of magnets **862***a-d* in the second end panel **833** also correspond with each other to magnetically couple the end panels **831**, **843** when folded against each other.

In each of these embodiments, the second jacket portion **722**, **822** may also include at least one switch activating magnet **768**, **868** for switching a tablet into sleep mode (e.g., when the jacket **710**, **810** is closed) and for switching the tablet into a wake mode (e.g., when the jacket **710**, **810** is opened). This switch activating magnet **768**, **868** may be located in the second jacket portion **722**, **822** at a position that allows the magnet **768**, **868** to align with a magnetically actuated switch in the tablet computer when the jacket is closed.

Referring to FIGS. **9-12**, the use of embodiments of a modular tablet case is shown and described in greater detail. As shown in FIG. **9**, a tablet computer **902** may be secured in a shell **912**. When secured in the shell **912**, the tablet computer **902** may be used together with a jacket or without the jacket. The tablet computer **902** in the shell **912** may be used with the jacket by coupling the shell **912** to the jacket or supporting the shell **912** on a stand formed by the jacket, as described below.

FIGS. **10**A-**10**D illustrate one method of folding a jacket **1010** to form one configuration of a stand **1080**. As shown in FIGS. **10**A and **10**B, the end panels **1031**, **1033** and foldable triangular panels **1035**, **1037** may be folded along the lengthwise foldable line **1032**, the lateral foldable line **1038** and the diagonal foldable lines **1034**, **1036** in a backwards direction away from the inside surface of the jacket **1010**. When the end panels **1031**, **1033** contact each other, as shown in FIG. **10**C, the corresponding magnetic coupling regions in the end panels **1031**, **1033** will magnetically couple to hold the end panels together. The edge of the end panels **1031**, **1033** and/or foldable triangular panels **1035**, **1037** thus form the stand **1080** that rests on a support surface such that the central triangular panel **1039** provides a support surface, as shown in FIG. **10**D. The shell **912** including the tablet computer **902** may then be supported against the stand **1080**. Alternatively, a tablet computer may be supported against the stand **1080** without the shell.

FIGS. **11**A-**11**F show various orientations for a shell **1012** resting on the stand **1080** formed by the folded jacket **1010**. FIG. **11**A shows the shell **1012** in a landscape orientation supported directly against the central triangular panel **1039**. In this orientation, corresponding magnetic coupling regions in the central triangular panel **1039** and the shell **1012** may hold the shell in place. FIGS. **11**B and **11**C show the shell **1012** in a landscape orientation resting against the central triangular panel **1039** and second jacket portion **1022** with different angular positions. In these orientations, the non-slip surfaces on the inside surfaces of the jacket **1010** and the back side of the shell **1012** may prevent the shell from slipping. FIGS. **11**D-**11**F show the shell **1012** in a portrait orientation and in similar angular positions leaning against the stand **1080**.

FIGS. **12**A-**12**C show another method for folding the jacket to form another configuration of a stand **1082**. In this configuration, the first jacket portion **1020** is folded along the lengthwise foldable line **1032** and the shell **1012** rests on the end panels **1031**, **1033** and the second jacket portion **1022**. FIGS. **10**A-**10**C show different angular positions for the shell **1012**. Magnetic coupling regions in the end panels **1031**, **1033** may be magnetically coupled to magnetic coupling regions in the shell **1012** to hold the shell in the supported positions. A non-slip surface on inside of the jacket **1010** and the back side of the shell **1012** may also prevent the shell **1012** from slipping out of the supported positions.

FIGS. **13**A and **13**B show yet another embodiment of a modular electronic device case **1300** for holding and covering a tablet-shaped electronic device **1302**. This embodiment of the modular electronic device case **1300** may be used for a smaller sized tablet computer such as the iPhone® tablet-shaped smart phone. The modular electronic device case **1300** includes a jacket **1310** and a shell **1312** removably coupled to one portion of the jacket **1310**. The shell **1312** may be magnetically coupled to the jacket **1310** or may be removably coupled using fasteners such as snaps or hook and loop fasteners. In this embodiment, one or more pockets **1314** are coupled to another portion of the jacket **1310** and may be configured to hold various items such as a backup battery **1315**, credit cards, identification card, money and the like. The pockets **1314** may be removably coupled to the jacket **1310**, for example, using magnetic coupling or fasteners. In other embodiments, the pockets **1314** may also be integral with the jacket **1310**.

The jacket **1310** includes a first jacket portion **1320** hingedly coupled to a second jacket portion **1322** with a hinge **1324**. The hinge **1324** may be a living hinge formed by the material forming the first and second jacket portions **1320**, **1322**. The jacket **1310** has an inside surface **1326** and an outside surface **1328**. The shell **1312** and the pocket(s) **1314** may be removably coupled to first jacket portion **1320** and the second jacket portion **1322**, respectively, on the inside surface **1326**. The first and second jacket portions **1320**, **1322** may thus be closed by folding along the hinge **1324** to cover the tablet-shaped electronic device **1302** when attached to the jacket **1310**.

The jacket **13010** may also include a closure **1321** for closing the first and second jacket portions **1320**, **1322**. In the illustrated embodiment, the closure **1321** extends from the second jacket portion **1322** and is magnetically coupled to the first jacket portion **1320**. The closure **1321** may also extend from the first jacket portion **1320** for magnetically coupling to the second jacket portion **1322**. The closure **1321** may also be removably coupled to the first jacket portion **1320** and/or the second jacket portion **1322** using other types of fasteners including, without limitation, snaps or hook and loop fasteners.

In this embodiment, the first jacket portion **1320** includes at least one lengthwise foldable line **1332** extending lengthwise across the first jacket portion **1320** forming foldable panels **1331**, **1333**. The foldable line **1332** may be formed as a living hinge from the material of the first jacket portion **1320**. The first jacket portion **1320** may be folded along the lengthwise foldable line **1332** to form a stand configuration for the tablet-shaped electronic device **1302**, for example, similar to the embodiment shown in FIGS. **12**A-**12**C.

In the illustrated embodiment, the first jacket portion **1320** has a size and shape corresponding to the size and shape of the shell **1312** such that the first jacket portion **1320** substantially covers the shell **1312** when the case **1300** is closed. The first jacket portion **1320** may be slightly larger or smaller than the shell **1312** and still substantially cover the shell **1312**. In other embodiments, the first jacket portion **1320** may have other shapes and sizes that do not cover the shell **1312** but are still configured to be coupled to the shell **1312**.

The shell **1312** is designed to receive and secure the tablet-shaped electronic device **1302**. The shell **1312** includes a main body portion **1340** with a front side **1341** for receiving the tablet-shaped electronic device **1302** and a back side **1342** for removably coupling to the first jacket portion **1320**. The shell **1312** also includes at least two edge portions **1343**, **1344** that grip opposing edges of the tablet-shaped electronic device **1302** to hold the tablet-shaped electronic device **1302** with a friction fit against the front side **1341** of the shell **1312**. In the example embodiment, the edge portions **1343**, **1344** extend lengthwise and include corner portions **1345**, **1346**, **1347**, **1348** that engage four corners of the tablet-shaped electronic device **1302**. Other configurations of the shell **1312** capable of securing a tablet-shaped electronic device are also within the scope of the present disclosure. The shell **1312** may include, for example, only two corner portions or may include edge portions on the other edges of the main body portion **1340**.

The shell **1312** may be designed to provide access to inputs and outputs of the tablet-shaped electronic device **1302** when secured in the shell **1312**. The example embodiment of the shell **1312** includes a camera window **1350** located in the main body portion **1340** and aligned with the camera on the tablet-shaped electronic device **1302**, a power button window **1352** located in the edge portion **1343**, and a control window **1354** located in the edge portion **1344** and aligned with controls (e.g., volume) on the tablet-shaped electronic device. At least one edge **1349** of the shell **1312** may be open, for example, to provide access to inputs/outputs, connectors and/or speakers. The shell **1312** may also include other input/output access windows in other locations depending upon the tablet-shaped electronic device. The control access windows may be any type of openings or cut outs capable of providing access to an input or output of the tablet-shaped electronic device to allow the input or output to function. The first jacket portion **1320** may also include a corresponding camera window (not shown) such that the tablet-shaped electronic device **1302** may be used to take pictures without removing the device **1302** and shell **1312** from the jacket **1310**.

In the illustrated embodiment, as shown in FIG. **13**B, a backup battery pocket **1314***a* is configured to hold a backup battery **1315**. The backup battery **1315** may include a battery known to those skilled in the art for use with a tablet computer such as an iPhone® smart phone. Examples of a backup battery **1315** include a battery with an 1800 milli-ampere

hour (mAh) capacity for an iPhone® 6 smart phone and a battery with a 2100 mAh capacity for an iPhone® 6 plus smart phone.

In other embodiments, the backup battery **1315** may be magnetically coupled to the second jacket portion **1320**, as shown in FIG. **13**C, instead of or in addition to being held in the backup battery pocket **1314***a*. For example, the backup battery **1315** may include metal inserts and/or magnets **1391***a*-**1394***a* that magnetically couple to one or more magnetic coupling regions **1381**-**1384** (see FIG. **13**A) within the second jacket portion **1322**. The jacket **1310** may also include a flap (not shown) for covering the tablet-shaped electronic device **1302** and/or the battery **1315** to protect the screen of the tablet-shaped electronic device **1302**.

The backup battery **1315** may be received and oriented in the jacket **1310** to allow the tablet-shaped electronic device **1302** to be charged with the case is closed. In the illustrated embodiment, for example, the backup battery pocket **1314***a* has an opening facing the inside of the case **1300** toward the electronic device **1302**. The backup battery **1315** may thus be positioned within the backup battery pocket **1314***a* such that a battery cable **1316** may be connected from the battery **1315** to the electronic device **1302**. Although the case **1300** is shown as open, the case **1300** may be closed with both the backup battery **1315** and the tablet-shaped electronic device **1302** located in the case **1300** while charging.

Credit card pockets **1314***b* may be located in a side of the backup battery pocket **1314***a* and configured to receive credit cards or other objects of a credit card size (e.g., a driver's license or other ID card). One embodiment of the at least one pocket **1314** may be formed by first and second pocket sides attached on at least three edges leaving an opening sized to receive the backup battery **1315**. The credit card pockets **1314***b* may be formed in at least one of the pocket sides.

The modular case **1300** may also include one or more pockets in other locations, for example, credit card pockets on the outside of one or both jacket portions **1320**, **1322**. The modular case **1300** may also include additional pockets or other structures for incorporating other peripherals used with tablet computers or tablet-shaped electronic devices.

In the example embodiment, the shell **1312** and the pocket **1314** are removably coupled to the jacket **1310** using magnetic coupling. To provide magnetic coupling between the first jacket portion **1320** and the shell **1312**, the first jacket portion **1320** includes one or more magnetic coupling regions **1361**-**1364** and the shell **1312** includes one or more corresponding magnetic coupling regions **1371**-**1374**. To provide magnetic coupling between the second jacket portion **1322** and the pocket **1314**, the second jacket portion **1322** includes magnetic coupling regions **1381**-**1384** and the pocket **1314** includes one or more corresponding magnetic coupling regions **1391**-**1394**. In this embodiment, the closure **1321** also includes a magnetic coupling region **1385** for magnetically coupling to a corresponding magnetic coupling region **1365** on the first jacket portion **1320**.

A magnetic coupling region may include one or more magnets oriented with a polarity for magnetically attracting and coupling a magnet with an opposite polarity in a corresponding magnetic coupling region. A magnetic coupling region may also include one or more pieces of magnetically attractive material, such as a metal, capable of magnetically coupling to a magnet. Although four magnetic coupling regions are shown in each jacket portion **1320**, **1322**, other numbers of magnetic coupling regions may also be used. In other embodiments, other coupling mechanisms may be used including, without limitation, hook and loop fasteners or snaps.

In the jacket **1310**, for example, one or more of the first jacket portion magnetic coupling regions **1361**-**1364** in the panels **1331**, **1333** may be magnetically coupled to one or more of the corresponding shell magnetic coupling regions **1371**-**1374** in the shell **1312** such that the back side **1342** of the shell **1312** is held against the inside surface **1326** of the first jacket portion **1320**. In one stand configuration when the first jacket portion **1320** is folded along the lengthwise foldable line **1332**, for example, the first jacket portion magnetic coupling regions **1361**, **1362** in the end panel **1331** may be magnetically coupled to the corresponding shell magnetic coupling regions **1371**, **1372** in the shell **1312**. As shown in the illustrated embodiment, one or more shell magnetic coupling regions **1371**, **1372** are located proximate an outer region of the shell **1312** proximate an edge of the shell **1312**. Thus, the outer region of the shell **1312** is magnetically coupled to the corresponding first jacket portion magnetic coupling regions **1361**, **1362** in the end panel **1331**. Although the end panel **1331** is shown as rectangular shaped, the end panel **1331** may also have other shapes.

In this embodiment, the structures of the jacket **1310** and the shell **1312** may be designed with a relative low profile similar to those described above. As described above, the jacket **1310** may be made from outer layers of a flexible material to provide the desired flexibility (e.g., at the hinge **1324** and foldable line **1332**) with additional rigid layers between the outer layers to provide rigidity in certain locations (e.g., in the panels **1331**, **1333** of the first jacket portion **1320** and in the second jacket portion **1322**).

In this embodiment, the outer layer on the outside of the jacket **1310** may be made of a leather, simulated leather or other similar material with a matte leather finish. The outer layer on the shell **1312** may also include a leather, simulated leather material or other material with a matte leather finish.

Magnets and/or magnetically attractive material may be sandwiched between the outer layers to provide the magnetic coupling regions as discussed above. As shown in FIG. **13**A, for example, the magnetic coupling regions **1361**-**1364** in the first jacket portion **1320** may include one or more magnets aligned with one or more magnets in the magnetic coupling regions **1371**-**1374** in the shell **1312**. These magnets are oriented such that north and south polarities of corresponding magnets are aligned when the shell **1312** is in the desired position relative to the first jacket portion **1320**. Thus, the position, orientation and polarities of the magnets facilitate orientation and alignment when magnetically coupling the shell **1312** to the first jacket portion **1320**. The magnetic coupling regions **1381**-**1384** in the second jacket portion **1322** may include one or more magnets with positions and/or orientations aligned with magnetically attractive material (e.g., metal strips) in the the magnetic coupling regions **1391**-**1394** of the pocket **1314** to facilitate magnetic coupling between the pocket **1314** and the second jacket portion **1322** in the desired position/orientation.

Accordingly, a modular electronic device case, consistent with embodiments of the present disclosure, may be used to hold, protect and support a tablet-shaped electronic device with versatility and without adding significant weight and/or bulk. In some embodiments, the modular electronic device is capable of incorporating additional peripherals such as a keyboard or a backup battery while maintaining a relatively compact, low profile.

Consistent with an embodiment, a modular case is provided for a tablet-shaped electronic device. The modular case includes a shell having a front side and a back side. The front side of the shell is configured to receive a tablet-shaped electronic device and the back side of the shell includes a shell

magnetic coupling region. The modular case also includes a first jacket portion and a second jacket portion hingedly coupled to the first jacket portion. The first jacket portion includes a first jacket portion magnetic coupling region configured to be magnetically coupled to the shell magnetic coupling region on the back side of the shell.

While the principles of the invention have been described herein, it is to be understood by those skilled in the art that this description is made only by way of example and not as a limitation as to the scope of the invention. Other embodiments are contemplated within the scope of the present invention in addition to the exemplary embodiments shown and described herein. Modifications and substitutions by one of ordinary skill in the art are considered to be within the scope of the present invention, which is not to be limited except by the following claims.

What is claimed is:

1. A modular case for a tablet-shaped electronic device, the modular case comprising:

a shell having a front side and a back side, wherein the front side of the shell is configured to receive a tablet-shaped electronic device and wherein the back side of the shell includes at least one shell magnetic coupling region, wherein the at least one shell magnetic coupling region is located on an outer region of the shell proximate an edge of the shell;

at least one pocket including at least one pocket magnetic coupling region;

a first jacket portion including a first jacket portion magnetic coupling region configured to be magnetically coupled to the shell magnetic coupling region on the back side of the shell, wherein the first jacket portion has a size and shape corresponding to a size and shape of the shell such that the first jacket portion substantially covers the shell when the case is closed, wherein the first jacket portion and the shell are rectangular, wherein the first jacket portion includes at least one lengthwise foldable line extending lengthwise across the first jacket portion forming at least one end panel, wherein the first jacket portion magnetic coupling region is located in at least the end panel such that the end panel is configured to be magnetically coupled to the outer region of the shell magnetic coupling region when the first jacket portion is folded along the lengthwise foldable line to form a stand; and

a second jacket portion hingedly coupled to the first jacket portion and including a second jacket portion magnetic coupling region configured to be magnetically coupled to the pocket magnetic coupling region.

2. The modular case of claim **1**, wherein the at least one pocket includes a battery pocket configured to receive and hold a backup battery.

3. The modular case of claim **2**, further comprising a backup battery configured to be received in the pocket and electrically connected to the electronic device.

4. The modular case of claim **1**, wherein the at least one pocket includes card pockets configured to receive and hold credit card size objects.

5. The modular case of claim **1**, wherein the shell comprises:

a main body portion shaped to cover a back portion of the tablet-shaped electronic device; and

at least two edge portions configured to grip opposing edges of the tablet-shaped electronic device such that the tablet-shaped electronic device is held with a friction fit against the front side of the main body portion.

6. The modular case of claim **5**, wherein the main body portion includes a camera window aligned with a camera location on the tablet-shaped electronic device.

7. The modular case of claim **5**, wherein at least one of the edge portions includes a control window aligned with a controls located on the tablet-shaped electronic device.

8. The modular case of claim **5**, wherein the edge portions include lengthwise edge portions.

9. The modular case of claim **5**, wherein the edge portions include corner portions configured to engage at least two corners of the tablet-shaped electronic device.

10. The modular case of claim **5**, wherein the edge portions include four corner portions configured to engage four corners of the tablet-shaped electronic device.

11. The modular case of claim **1**, wherein the first and second jacket portions are hingedly coupled with a living hinge.

12. The modular case of claim **1**, further including a closure extending from at least one of the first and second jacket portions for engaging the other of the first and second jacket portions to close the jacket.

13. The modular case of claim **12**, wherein the closure magnetically couples to the other of the first and second jacket portions.

14. The modular case of claim **1**, wherein the shell magnetic coupling region and the first jacket portion magnetic coupling region are configured to have a stronger magnetic coupling with the shell in one orientation relative to the first jacket portion.

15. The modular case of claim **1**, wherein the jacket has a thickness less than 5 mm.

16. The modular case of claim **1**, wherein the shell has a thickness less than 15 mm.

17. A modular case for a tablet-shaped electronic device, the modular case comprising:

a shell having a front side and a back side, wherein the front side of the shell is configured to receive a tablet-shaped electronic device and wherein the back side of the shell includes at least one shell magnetic coupling region, wherein the at least one shell magnetic coupling region is located on an outer region of the shell proximate an edge of the shell;

a first jacket portion including a first jacket portion magnetic coupling region configured to be magnetically coupled to the shell magnetic coupling region on the back side of the shell, wherein the first jacket portion has a size and shape corresponding to a size and shape of the shell such that the first jacket portion substantially covers the shell when the case is closed, wherein the first jacket portion and the shell are rectangular, wherein the first jacket portion includes at least one lengthwise foldable line extending lengthwise across the first jacket portion forming at least one end panel, wherein the first jacket portion magnetic coupling region is located in at least the end panel such that the end panel is configured to be magnetically coupled to the at least one shell magnetic coupling region when the first jacket portion is folded along the lengthwise foldable line to form a stand;

a second jacket portion hingedly coupled to the first jacket portion; and

a backup battery configured to be coupled to the second jacket portion.

18. The modular case of claim **17** wherein the backup battery is configured to be magnetically coupled to the second jacket portion.

19. The modular case of claim 17 further including a pocket configured to be coupled to the second jacket portion, and wherein the backup battery is held in the pocket.

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